5: Schwimmer E-4,5 (1966-1967) 1973
OJ23 Orokaiva OJ23
Mountain Orokaiva

Though Monckton reports (1921) a few large villages in the early post-contact period, it is only recently, in response to Australian pressure, that multi-clan villages, with populations ranging from 100 to 500, have become common. Most of the plantations found in the Northern district have been established by Australian ex-servicemen supported by government loans. A number of Orokaiva have been drawn to work on these plantations, others to jobs in Popondetta, others again to service with the police, the armed forces or employers outside the district. Such migration has substantially reduced the proportion of the male village population group.[2]

2. *Technology and Aesthetics*

We possess only the briefest description of Orokaiva industry (in Williams 1930). Although I did collect additional data, the traditional technology has been transformed to such an extent that my data must needs be fragmentary. The only axes and adzes now in use are made of steel; most of the various stone-made cutting tools described by Williams are no longer in use, being replaced by the ubiquitous bush knife wielded by young and old, male and female. One exception is worth noting, if only to emphasise an element of continuity: cockle shells are still used for the scraping of coconuts and for the shaping and decorating of pots. Most of the needles used by women are still made of flying fox bones (*poma*), even though a few needles have at times been obtained from the Mission. While files for sharpening tools are necessarily made of steel, rough leaves still serve as tools for scraping pots, smoothing down wood, etc. The same mixture in the use of basic tools is found in agriculture, hunting, and fishing: we still find the digging stick but also the axe; traditional hand nets and fishing spears (with steel tips), but also snorkels. For hunting, traditional devices have been almost entirely replaced by the shot gun. The old technology is still basically intact in those few industries which are directly related to ceremonial life: the making and decorating of loin cloths, feather headdresses, ceremonial weaponry, musical instruments such as drums. Certain other specifically feminine artifacts (mats, baskets, string bags) are still produced and in use, while much of the contemporary Orokaiva house-building technology is traditional. Fine wickerwork for ceremonial objects (armlets, spear decorations, etc.) is still made by some of the older men. Orokaiva women have almost stopped making pots, though this was an important industry in pre-contact times. While trade goods are used for everyday purposes, such pots as are still made serve as gifts to women at the time of marriage. They are kept for sentimental reasons, but we were able to see only very few.

An everyday Orokaiva meal consists of taro, often with a few vegetable condiments: coconut milk, cordyline tips, or edible pitpit,[3] or one of a number of herbs, sometimes of supposed medicinal value. Much care is devoted to the cooking of the taro and variety is provided partly by a choice from many varieties of taro growing in most gardens. In the dry season, any of a number of subsidiary foods (sweet potato, German taro, yam, banana, breadfruit and several others) may be added to make the taro stretch further. Meat or fish is eaten only rarely, usually on festive occasions. Foods like tea, sugar, bread and salt are also reserved for such occasions. Although several traditional methods of

5: Schwimmer E-4,5 (1966-1967) 1973
OJ23 Orokaiva OJ23
Mountain Orokaiva

dismissed by a seeker of ancient lore, but contained some myths of obviously recent vintage which helped me to understand contemporary Orokaiva thought. I was told that before the Europeans came, the Orokaiva used to make only very small gardens. They were in constant danger of starvation and depended greatly on wild fruit. I copied the names of these, but was told that many of them were never eaten nowadays. (Many are inedible.) In those days, people did not make feasts as they did not grow enough food. The large gardens people have at the present time were introduced only when the Europeans brought steel axes and knives.

In other villages I was told similar stories about a primordial state of wretchedness when people cultivated no taro but ate wild fruit now considered inedible. But this period ended when the *dema* introduced the elements of traditional Orokaiva culture. In Hohorita, culture history had become foreshortened. Other Orokaiva distinguished the traditional *dema* stories which occurred in the dim past from the stories concerning the arrival of the Europeans; they recognised in fact *two* periods of fundamental change: one ancient and complete, the other recent and incomplete. In Hohorita tradition, these two periods have to some extent become fused. The premature death of men born between, say, 1890 and 1910 deprived the men of today of any factual knowledge of the coming of the European: it has already been turned into myth and placed, so to speak, *in illo tempore*. But this unusual development only emphasises how closely the gifts of European culture are identified with those of traditional *dema*.

The chairman of the Higaturu Local Government Council, who also happened to live at Hohorita, had long conversations with me about the constitution and activities of the council. On one occasion I wished to discover to what extent the council had been set up in response to popular aspirations and to what extent the councillors (as opposed to the Australian adviser) made decisions on basic policy. Answer: because the government had a council at Rabaul, it decided to have one in the Northern District as well. Did the people want the council? They had been given schools; they had been given coffee to market. They therefore thought the council would also be good. Would it not be better for the people to decide for themselves how their problems should be solved instead of leaving all decision-making to the government? The council did not come from ourselves but from the administration. We do not know about the council. It belongs to the administration and it was given to the village people.

The Department of District Administration had recommended this informant to me as being the most knowledgeable in the district on the subject of the council. I found his knowledge of the facts to be most accurate, and at council meetings he was the only man who dared to argue with the advisory officer. But when I questioned him on the level of social philosophy, he fell back on the standard Orokaiva explanation: power and strength come to us not from things we have invented or made ourselves, but from things that have been given to us by our exchange partners. This is precisely what Councillor Ase said: if the Orokaiva of today desires to have an *ivo* equal to that of his ancestors, he has to follow the instructions of the council, i.e. to build a new village, grow coffee, individualise land titles. This, at the present time, is his best available source of power and strength. In other words, it is not a matter of villagers independently

5: Schwimmer E-4,5 (1966-1967) 1973
OJ23 Orokaiva OJ23
Mountain Orokaiva

writings of Berndt, Brookfield and Brown, Hogbin, Lawrence, Meggitt, Rappaport, Salisbury, Serpenti, Wagner and several others. The Orokaiva system falls within this general pattern, though with less emphasis on overriding rights held by clan and lineage, and more emphasis on individual rights than, for instance among the Siane and Mae Enga, less emphasis on corporate leadership than among the Garia, and more incidence of duality of rights than among the Chimbu, and so forth. Though the time has come when a comparative study of these systems could profitably be undertaken, it falls outside my present purpose which is to analyse the significance of land transactions, especially among the Orokaiva.

In order to carry out this analysis, we must first describe the basic categories of land transactions. We shall not use the term 'transactions' solely in a legal and economic sense, but more broadly in accordance with Mauss' concept of exchange as a total phenomenon. Thus, land enters crucially in 'transactions' between husbands and wives, and between men and spirits, and these 'transactions' will be considered before we turn to the more familiar topic of transactions between men. Here we have to distinguish between transactions within and outside the patrilineage. Our general argument will be that all of them occur as part of a continuing series of social exchanges, and that useholds granted on varying conditions must be regarded basically as benefits exchanged for other past or future benefits. In as much as paternal protection and filial service are very common objects of social exchange in these transactions, paternal protection being mediated by land grants, we may observe the practical operation of a system of patrifiliation.

A few words should first be said about the significance of land itself. The Orokaiva spend most of their days in their individual garden plots. They are tied to them not only by a total dependence on the produce, but also by deep bonds of affection. A man and his wife like nothing better, generally, than to spend the whole day, and virtually every day, in their garden together. These are intimate places where nobody would go without an invitation and where nobody is disturbed or called away except in a serious emergency. They are the most private places the Orokaiva has, much more private than the village houses where every sound and movement can be seen or overheard. Even so, physical privacy is secured often by no more than a narrow ring of second growth around the cultivations. Many people have a garden house, ornamental shrubs, places to rest and sit. Orokaiva gardens can be very homely and beautiful. People rest there in the heat of the day. They are favourite places for love-making.

The most ubiquitous of all social transactions mediated by the land occur between husband and wife. Perhaps the most important rights and obligations arising out of marriage have to do with garden land. Both the male and female gardening tasks are, of course, learnt before marriage. Bachelors have their own gardens in which they do all the work which is not specifically set aside for women and taboo to men. They clear the land; they help with planting (using the digging stick); they protect the land against pigs and other dangers; they weed. It is a fact, already observed by Williams, that a girl choosing a husband takes serious account of the state of the garden of her intended spouse. She does not like to marry a man whose garden is in a poor state. The bachelor is assisted by a sister, or brother's wife, or by his mother with the dropping of seed into the

purchases. In this way the shareholders obtained additional rebate benefits. In general, however, sales to non-shareholders correlated fairly closely with the presence or absence of small coastal trading vessels at the wharf.

Most of the buying at the store was done by men. There were no women shareholders, but wives and daughters used their husbands' and fathers' share numbers when purchasing goods.[1] The men were discriminating buyers and a man who had walked some miles to the store to buy a specific item would usually stand for a while surveying the goods displayed and asking a question or two about prices. After the purchase was made, usually of only one or two items, the buyer left the store, but usually stopped to chat at Surilai village on the northern side of the store before going home.

An analysis made of the spending patterns of a group of 27 Yega shareholders over a two-year period (January 1961-December 1962) showed that of a total expenditure of $1148, 49 per cent was spent on food (mainly tinned meat, tinned fish, rice and sugar), 11 per cent on tobacco, 11 per cent on clothing, 7 per cent on kitchen utensils, 3 per cent on garden tools and 17 per cent on miscellaneous items including torches, soft drinks, kerosene, matches, fishing gear, etc.

The most sought after foods were those with high protein content - tinned meats and fish. Only one bicycle (costing $32) was sold during the two years surveyed. The low rate of spending on garden tools is noteworthy, considering the importance of gardening in the Yega economy; but axes and bush knives were carefully guarded and, being very durable they needed only occasional replacement.

Almost every Yega child over six years of age and every adult of both sexes owned at least one item of European-type clothing. On working days, cotton skirts were worn by the girls and women, and shorts or cotton loin cloths by the men, but tapa (bark cloth) skirts were preferred by the adolescent girls and tapa boavo (bark loin cloth) by the older men for Sunday wear. Most people preferred to purchase their clothing requirements from the wider range available in the larger Popondetta stores rather than from the co-operative.

Retail trading showed a remarkable increase from 1961-2 to 1962-3. The turnover doubled during the financial year but a fall-off in trade of about 12½ per cent occurred in 1963-4. This situation probably resulted from lower spending by Yega shareholders,

[1] In the course of six or seven visits to the store I can recall only once having seen a woman at the counter.

Land use

241 Food gardening: The people have been able to select the best land for cultivation, avoiding the rugged hillsides with their infertile stony soils and the kunai grasslands which are difficult to clear. The soils which they use for gardening are sufficiently fertile to give satisfactory food production without the application of artificial fertilizer. Yields are maintained by a system of bush fallowing, whereby the land is cropped once, and then left to revert naturally to regrowth for a period of approximately eight to fifteen years. There is no evidence of soil erosion or decline of soil fertility under this system and if land were in short supply the average period of fallow could probably be shortened considerably without reducing fertility. However, if a shorter fallow period was adopted, pests and diseases would probably multiply thereby causing a decline in crop yields. Moreover, short rotations enable kunai grass to become established, and this makes cultivation more difficult, as kunai is almost impossible to eradicate.

Clearing the virgin forest(1) in preparation for gardening presents considerable difficulty. However clearing the regrowth for subsequent gardens is very much simpler, and this
●[412] is the more common pattern. Axes and bushknives are used to clear the vegetation in preparation for planting the food crops. The dry season is the most suitable time for this operation as the felled vegetation dries quickly and is easily burned, but clearing is carried on at all times of the year. After the bush
[412] is cleared, the dead timber is stacked and burned. The food crops are then planted with the aid of a digging stick. The garden is usually weeded two or three times before the crops are harvested.

Approximately ninety per cent of the land cleared is planted with the principal crop, taro (Colocasia sp.) of which at least nine varieties are grown. These varieties differ in the length of time required to mature and in resistance to drought. Though some planting takes place throughout the year, most of it is done in three periods, namely August-September (the end

(1) What is regarded as virgin forest may well have been cropped many years ago, but if so the fact has long since been forgotten by the present inhabitants.

CHAPTER 3 - OTHER PROPERTY

Housing

342 All materials for building the Inonda village were
319 acquired from land and trees in which the people hold rights of
423 one form or another.(1) The framework is usually made of wange saplings and the floor of black palm. Sago thatch is used for the roof and split sago midribs for the walls. Saplings for the framework may be obtained from any virgin bush or second growth though most people said they used saplings which they had cut during the course of clearing new gardens.

Sago for the roof and walls must be acquired from one's own trees unless they are inadequate, in which case it is necessary to negotiate with someone who has a surplus. Of the eight houses in the village, sago for three of them was obtained from trees belonging to the household head and for three others from trees belonging to the father of the household head. One, who has only permissive status in the village, obtained sago from his daughter's husband's father's trees. The last man has insufficient trees and obtained thatch from trees on his mother's clan's land in a neighbouring village.

Tools and equipment

412 Very few agricultural implements are used. Each
422 adult male has an axe for felling bush and every man and woman has a bush knife which is used in weeding, clearing and harvesting. Planting is done with a digging stick. There are no other gardening implements in regular use.

412 The axes and knives were bought from local trade
435 stores and though actual prices paid are not known, current re-

(1) With the exception of a few sheets of iron used for ridging and eaves which were collected from ex-army dumps.

placement cost is 19/6 for an axe and 12/6 for a bush knife, or a total of approximately £2.10.0 per family.

Most men own a shovel or two and three men have picks, but these were all collected from an abandoned army dump. They are used mainly for digging house posts and drains, though some use shovels to plant sweet potatoes. Most households have a grass-cutting knife for cutting grass around the houses and along the roads and a few men have some basic carpentry tools.(1)

Every man has one or more hunting spears which he has either made himself or inherited from a real or classificatory father. They are simple weapons and are said to take not more than a day to make. The councillor owns a gun which he purchased for £29.0.0.

Livestock

Domestic pigs and fowls are kept in small numbers. They are said to be owned by men, cared for by women, and eaten by all. They are killed only for feasts. Six householders have one pig each, one has three and one has seven. Only four households have fowls - one has twenty-four, one has two and two have one each. Eight of the pigs were bred by the owners, one was purchased for £1 cash, one was given by a man's former work-mate and six were given as piglets by relatives. Twenty-four of the fowls were obtained by barter, one by cash purchase, two by gift from a former work-mate and one by gift at marriage from a relative.

The only other domesticated animal is the dog, of which there are three in the village. Though only two men have dogs, they are used quite frequently for hunting.

Owing to the constant pressure on owners to make

(1) The total agricultural and other tools in the village are as follows: 10 shovels, 11 axes, 18 bush knives, 9 grass knives, 3 picks, 1 hoe, 7 hammers, 4 saws, 1 pinch bar, 3 chisels, 1 adze and an assortment of hunting spears. Total current replacement value is £88.5.0.

463 Trading. Almost all entrepreneurs felt that trading provided, 472 or should have provided, more reward for the effort invested than 444 cash cropping. Even those who had lost by trading wanted to return to it and C, D and E were saving their income from cash crops in order to restock their unsuccessful stores.

Table 14

Months of store's operation

A	2 (closed in Jan. 1964)	E	26	I	3
B	36 (closed in June 1964)	F	19	J	6
C	22 (closed in Sept.1965)	G	6	K	5
D	18 (closed in June 1965)	H	20	L	15
Average	19.5		17.75		7.25

The table above shows that the most successful stores are on average the most recently opened. There is a negative correlation between length of operation and trading success for each store. It may be that there is an optimum period of satisfactory functioning for stores owned by indigenes, after which custom declines. We have no evidence on this point and there are many variables on which the more successful traders differ from the less successful. Other variables, unrelated to the traders themselves, could influence the success of stores. These include the proximity of any other types of stores and the preference of some villagers for patronising co-operative stores rather than individually owned stores (see Crocombe 1967:21). The location of the store in relation to residence of the owner (see page 30)[1], to roads and to other sources of casual custom (e.g. a plantation, a road or other construction project) is also significant. We do not, however, have measured data on these variables.

[412] Tools and equipment. All the entrepreneurs in the sample have many more tools and equipment (current replacement value averages $148.80; range $46.40 to $376.45) than ordinary villagers.[1] There is not, however, any apparent relationship between trading success and value of tools and equipment.

[1] By contrast, average current replacement value of tools and equipment per householder in three villages was $7.58 in Ongoho (Crocombe, unpublished), $18.38 for Sivepe (Rimoldi 1966:25) and $21.06 for Inonda (Crocombe and Hogbin 1963:45).
A [See Category 463--Analyst]

Table 15

Replacement value of tools and equipment

A	$101.70	E	$138.05	I	$164.30
B	87.50	F	82.90	J	142.80
C	254.80	G	113.60	K	46.40
D	54.70	H	376.45	L	222.40
Average	$124.68		$177.75		$143.97

Traditional valuables. The possession of hambo (bone and shell ornaments) and di (feather headdress) may give some indication of a man's adherence to traditional values. In traditional Orokaiva society the possession of such valuables demonstrated wealth and prowess, but this function is now being taken over by money, as the relative importance of cash as the means of procuring desirable products increases, and money transactions become more frequent. Hambo and di are inherited through the father and sometimes other relatives, and they are usually distributed among the surviving sons. It is difficult to assess the traditional valuables owned by any one individual, as a man often looks after his younger brothers' shares and more than one person, both within and without the nuclear family, may have rights to the hambo and di kept in a particular household.

As shown in Table 16, subjects A to D possessed an average of $31.51 worth of traditional valuables, subjects E to H $46.16, and I to L (only one of whom has any such valuables) $7.50. H, the owner of the largest quantity of valuables, acquired them by inheritance and does few transactions with them today.

Table 16

Cash value of traditional valuables*

A	37.33	E	50.00	I	30.00
B	25.00 (assessed)	F	11.15	J	-
C	63.70	G	49.90	K	-
D	-	H	73.60	L	-
Average	31.51		46.16		7.50

* Values were calculated according to rates set out in Crocombe and Hogbin 1963:97-9. If a man held valuables jointly for himself and other kin, only his proportionate share is listed above.

18: Dakeyne K-S (1962-1964) 1969
OJ23 Orokaiva OJ23
Yega

482

[Housewife carrying garden produce and firewood back to her village, a distance of up to four miles. Her load, excluding baby, is about 100 pounds.]

INTRODUCTION

433 THE traditional economy of New Guinea villages was radically different from our own. Whilst our economy is based upon the production of surplus goods which can be sold for profit, thus providing capital which in turn may be invested to produce greater profits, the key note of the New Guinea economy was 433 self-sufficiency. Traditionally, the people of 24 New Guinea were subsistence cultivators plant- [226] ing their food crops in small clearings in the [224] forests and supplementing this food supply by [222] fishing, by hunting the animals which live in the forests and on the grasslands and by gather- ing the edible produce of wild vegetation, notably sago. Only the simplest implements [412] were available: stone axes with which trees [392] could be laboriously felled or ring-barked; fire for burning-off the mass of felled timber, vines, and leaves; and sharpened sticks with which holes were made for planting seeds and cuttings. In only a few limited areas, notably the central highlands of the main island, was there any attempt at digging or cultivating the soil prior to planting; in most areas cut tings or seeds were planted in holes made directly in the cleared, ash-covered ground. [128] The burned clearing thus made and used for the growing of food crops is referred to in this book as a swidden.

433 Such an economy, in which there was no 24 concept of saving and no profit motive, tended 179 to be resistant to change; innovation was un- [412] necessary. But with the coming of white men possessing a superior technology, an important change occurred: steel axes, knives, and spades

(P.I-A)

433 241 122 (412) were introduced. The use of these tools has greatly lightened the work of the New Guinea gardener and substantially reduced the time needed to produce his vegetable foods. Thus time was available, when the incentive was supplied, to produce crops which could be sold for cash.

241 242 The introduction of new tools has not, however, had any marked effect upon the methods by which a New Guinea villager produces his food crops. Long ago he discovered by experience what agriculturalists have later discovered scientifically, that tropical soils when exposed to the sun and rain very rapidly lose their plant nutrient content (particularly nitrogen) and without the addition of fertilizer they will not sustain crop yields. In order then to make the most efficient use of cleared land, the villager plants his swidden with a variety of food crops, mainly tubers, which, maturing at different rates, help to maintain a constant food supply. Swiddens are usually abandoned after twelve to eighteen months and allowed to return to forest. Meanwhile new clearings are made and crops planted to ensure continuity. Forest is allowed to regenerate on old swidden sites for a period of five to twenty years depending on the population density and consequent pressure upon the land. Provided that the forest cover is left for about ten years between periods of cultivation, soil deterioration does not usually occur. Under this system of land use, which can best be described as one of shifting-field agriculture, the average land requirement is a quarter of an acre per head per

241 242 311 (P.1-B)

142
241
412
411

Fig. 7. *The New Guinea gardener's work tools, an axe, and large bush knife. The strong heavy spear is carried just in case he should see a wild pig. The cigarette, rolled with newspaper, is almost indispensable to most New Guineans* [276]

trunk of the sago palm which grows in wet or swampy ground. The sago is extracted by first cutting down the palm, then pounding up the fibre and washing out the starch. This passes through a coconut fibre screen into a settling tank. Four people can make 100 pounds of sago a day. [461]

222
252

e) *Grass fires.* The origin and extension of tropical grasslands has long been a matter of debate. Large areas of grassland occur in Yega territory where villagers regard them as practically useless. Grasslands are extended by fire but only in special circumstances. Grassland fires seldom penetrate or destroy an area of mature rain forest or even areas of well-developed secondary growth. The danger period is the first two years after a swidden is abandoned. At this time there is a large quantity of grass and undergrowth amongst the young trees. If a fire spreads from adjacent grasslands to this highly inflammable material the young trees are destroyed. Being immature, they have not yet seeded and further forest regrowth is prevented. This circumstance is most likely to occur on the south-west margins of grassland areas where strong north-easterly

372

[P10-A]

177 Housing and village improvement: The changes in this aspect of culture
are capable of fairly precise description, which has been provided in
Table 10.5. This table applies to Sivepe only; I shall refer to some
minor differences between Sivepe and Inonda at the end of this section.
335 The changes may be analysed into several main types. First, there is
412 the extent to which European materials and tools are used. Here, we note
177 that nails were a building material as early as 1951 (and therefore
also hammers), but a significant change has been the extent of their
use. The introduction of nails was partly a time-saving device, as
framing can be efficiently lashed together with the bark fibres
traditionally used. On the other hand, the "timber" walls might not
be easy to lash together and nails are probably necessary here. On
the other hand, the blackpalm or betelnut which is used for the floors
does not take nails at all well and the lashing is a superior technique,
177 used in almost all the houses. Secondly, there have been changes in
342 house design, and the use of materials. The increase in house size,
which was the most striking of the innovations, was general throughout
the village, according to a standard set by the leader and adhered to
by everybody. The change from betelnut to blackpalm flooring is
towards a superior, toughter material, harder to work and comparatively
rare in the Sasembata district. The change from sago to "timber"
walls was purely a matter of aesthetic fashion. I was told by Mr.
Sebire that it started in the early 1950's in the Kokoda district; in
Sasembata district it does not seem to have started until around 1965.
The new houses at the mission station had "timber" walls; so had the
new houses in several other nearby villages. Sivepe, being built on
a new site after the fashion started was wholly built in "timber"
(except for a few houses shifted from the old site and standing on the
new one and gradually replaced). The "timber" looks like weatherboard,
[335] which has been used on Australian houses in the Kokoda district. It
is cut from logs sawed to a length of six feet, which are then split
into shingles with a bushknife, a procedure which takes much time and
skill. The six feet long shingles are generally 3/8 inch thick and
five inches wide. The intention is to overlap them, providing better
protection against wind and rain than the sago walls have. The work of
cutting the shingles is so arduous, however, that the overlap is usually
quite small when the houses are built; as the logs are split green, the
timber shrinks until cracks appear between the boards.

The third type of change is that actually advocated by European
177 authorities. (The timber walls, according to administration officers,
[342] were a purely Orokaiva idea.) For reasons of hygiene, the administration
wanted the houses to have windows, which traditionally they did not
have. The new houses have large windows, but they are all blocked up
with boards (to keep the wind and rain out) so that they are not functional,
[364] except in warding off criticism from Australian officials. The village
improvement measures: elimination of pigs, lavatories, rubbish holes,
[351] pens for chickens; are all based on European advocacy. The neat lines
of crotons and other shrubs, which are beginning to form a standard

A [See Cat. 116, p. 215--Analyst]

177 part of village layouts, are a blend of Papuan tradition (the Orokaiva
[351] have always been very fond of flowers and planted ornamental shrubs)
[363] and a new Australian-derived passion for military regularity. This is evident especially in the emphasis placed on building the houses in a line, and equidistant; the shrubs are also rigidly in line.

177 The changes are to some extent due to the experience of Ilimo
342 camp which is reflected in the style of Old Sivepa. The changes found in New Sivepa are due to subsequent influences, mainly that of the Local Government Council. Once village improvement became an ideologically validated objective, the way was open to the adoption of further innovations borrowed from the Kokoda district, such as the use of "timber." I did not see "timber" used East of the Sasembata district.

[182] It may well be that the increase in house size, coupled with the present need to build a large number of houses in the same year to form a major modern village, would rapidly have led to a critical shortage of sago in Sivepa if people had continued to use this material for walls. Thus, the present practice of using timber instead of sago could well have an economic explanation. Sago roofs can be built without destroying the plants, whereas plants have to be cut entirely to produce sago walls. I was not, however, given an economic explanation for the change-over to timber; I was told only that it was better-looking and provided good protection against wind and rain. But nobody would say anything against sago; sago walls are "also very good."

177 Tools and skills: Traditional agriculture has undergone considerable
241 change, as elsewhere in New Guinea, by the introduction of steel axes,
[412] bush knives, grubbers etc. Thus the preparation of the soil for gardening has been greatly facilitated. There has, however, been no change in the operations concerned with the plants themselves, planting and harvesting being done with wooden digging sticks. Many of the men have had experience in rubber plantations, with operations such as tapping; there are a few tapping chisels in the village. Training in coffee cultivation occurred after the eruption, but it was not until a few years ago that hulling machines were introduced. Every grower
177 at Sivepa has, as far as I know, only one coffee sack. The basic
245 skills needed to bring rubber and coffee to market have been mastered,
249 but up-to-date techniques for improving the yield of the trees have not been mastered. The difficulty, in this respect, is not purely one of communication, as men who have been employed as rubber tappers must be familiar with certain rules regarding care of the trees which are definitely not being practised. Similarly, I doubt whether one can explain failure, on the part of Sivepa growers, to prune their coffee trees by ignorance of pruning techniques. The true explanation would appear to be a lack of confidence that the rules make any difference to the yields. In Hohorita people began to prune their coffee trees when they discovered they were then easier to harvest. But the whole pattern of reasoning upon which Western horticultural practises are

Section 2: Economic Assistance

177 433 Subsistence: Undoubtedly, European contact had a profound influence on the subsistence economy, both through the introduction of steel tools and of the pax Australiana. The government did not, however, intervene directly in the operation of the Orokaiva subsistence economy; it was a very simple economy, but it provided, in general, adequate nutrition and housing. The first time the Orokaiva subsistence 731 economy broke down seriously in the post-contact period was immediately 657 after the eruption of Mount Lamington. The government therefore decided to offer some limited assistance towards the re-establishment of the subsistence economy in the resettlement villages built when the refugees left the evacuation camps. One requirement of the new villages was a food supply until new gardens had been made and harvested. This [241] requirement was met by the planting of a quick-growing variety of sweet potato in villages in the vicinity of Ilimo camp. The government also bought up any root crops the Orokaiva could supply and distributed these in the resettlement villages throughout 1951, as needed.

The opportunity offered by the evacuation camps was also taken 731 to introduce a few innovations which, it was thought, would improve 242 subsistence gardening in the resettlement villages. People were taught the cultivation of the variety of sweet potatoes mentioned above, as well as of corn, tomatoes and beans. Seeds and plants were supplied. An agricultural officer demonstrated on a large scale the growing of [412] sweet potatoes and peanuts. In order to facilitate the rapid establishment of gardens--which the government hoped would be bigger and better than the pre-eruption ones--small spades were distributed to villages. These small spades were not a familiar implement to the Orokaiva, but the agricultural officers thought they would be more efficient than the wooden implements and large shovels hitherto used in villages. These small spades cannot have taken on very well; I saw none in Sivepa or Inonda. I myself had brought a spade for the garden I established in Sivepa, but my neighbour, upon seeing it, at once supplied me with a grubber (ex-American army stock). A very brief acquaintance with the root structure of the garden weeds convinced me that a spade was indeed [227] of limited utility. Finally, in order to add to the supply of protein in the resettlement villages, the camp superintendent distributed some snorkels for catching fish.

Keesing reports there were fears in the camp that the eruption 731 would have destroyed taro seed stock, but this fear proved unfounded. 134 The taro plants remained perfectly healthy and the volcanic ash made the soil amazingly fertile for awhile, so that food shortages were quickly relieved.

731 657 Issue of Food: In the camps, rice, tinned meat, tobacco were distributed according to a ration scheme based on the census figures. Each village constable was issued with rations for the number of people resident in the villages under his control. These distributions were continued in

114 kind enough to show me this study in manuscript, I shall utilise it
464 here. The general question with which Mr. Waddell is concerned is
whether earlier students of societies depending on shifting agriculture
are right in saying that such societies, at least in fertile regions,
[166] have a considerable potential labour surplus. He proceeds to argue
[167] that, in the light of detailed data on the use of time in Sivepe, what
potential labour surplus there might once have been has already been
taken up by labour migration of male adults (which, for his sample, he
puts at 37.8%). Waddell takes issue with Fisk (1962: 465) who defines
economic activity as comprising only the production of food, clothing
and shelter, and argues that, given the existing socio-economic matrix,
all the other activities listed on his time charts (see Table 5) A
should be regarded as economic because they buy status and security.
[412] He also takes issue with Salisbury (1962: 216-20) who proposes that
[461] the change from a stone-to-steel technology in the New Guinea Highlands
has resulted in a saving of two-thirds in the time allocated to specified
axe-using tasks and who concludes from this that a vast potential labour
surplus is thus created. Waddell shows, by a quantitative study of
the allocation of time within activities, that only 38.3% of the time
allocated to an activity is actually given over to the main task, and
even if one includes ancilliear, and other productive tasks, this
raises the proportion to less than 50% of the total time devoted to
that activity. (See Table 17.) B As steel implements are used for only
a portion of productive tasks, they did not, Waddell argues, make a
crucial difference to Orokaiva work patterns.

114 If at the time of Mr. Waddell's study (1964), the potential
464 labour surplus in Sivepe was small, how was it possible to fit in such
461 new additional activities as the growing of coffee? Mr. Waddell was
in an excellent position to discover this as at the time of his survey
241 seven of 15 households surveyed engaged in cash-cropping; he was therefore
able to inquire how this affected the time spent on subsistence food
production. As it happened, the median time spent on subsistence
gardening by the whole sample equalled precisely the median time
spent by the cash-cropping households. (12.6 hours per week, vide
his Table 5:5) It appears from the table I derived from Mr. Waddell
(my Table 17) how the cash-cropping families fit in this extra work:
they spend a great deal less time having rests and meals. While non-
cash croppers allocate only 28.4% of the time within activities to
their main task, the cash-croppers allocate 50.6%. Though Mr. Waddell
gives interesting explanations which account for part of this discrepancy,
even if full allowance is made for these, the fact remains uncontestably
that the cash-croppers simply work harder.

114 Mr. Waddell proceeds to show, by a detailed psychological
241 assessment of the cash-cropping individuals, that they are indeed the
177 most acculturated and industrious members of the community. This
seems to suggest a considerable heterogeneity in working habits as
between the members of the community. The author clearly shows this
heterogeneity to exist as between the sexes and between different age
A,B [See Cat. 116, pp. 209-210, 223-224, respectively--Analyst]